

WHAT IS CLAIMED IS

1. A polypropylene resin which has a M_w/M_n of less
5 than 5, a melt flow rate of less than 7 g/10 min, a 1%
secant flexural modulus of greater than 300,000 psi and
less than 2% by weight xylene solubles.
2. The polypropylene resin of claim 1 wherein the
10 polypropylene resin has a haze of less than 30%.
3. The polypropylene resin of claims 1 or 2 wherein
the polypropylene resin has a crystallinity of at least
70%.
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4. The polypropylene resin of claim 3 wherein the
polypropylene resin has an isotactic pentad/triad ratio of
greater than 95%.
- 20 5. The polypropylene resin of claim 4 wherein the
polypropylene has a crystallization temperature of greater
than 130°C.
- 25 6. A polypropylene resin composition, comprising: a
polypropylene having a M_w/M_n of less than 5.5, a melt flow
rate of less than 5 g/10 min, a 1% secant flexural modulus
of greater than 300,000 psi, less than 1% xylene solubles,
a haze of less than 25%, a crystallinity of at least 70%,
an isotactic pentad/triad ratio of greater than 95%, and a
30 crystallization temperature of greater than 133°C, wherein
the polypropylene contains 750 ppm to 1500 ppm of a
nucleator/clarifier additive.
7. The polypropylene resin composition of Claim 6,

wherein the polypropylene comprises a homopolymer polypropylene and the composition further comprises less than 40% by weight of the total composition of an ethylene/1-octene copolymer having a density of from 0.865 to 0.91 g/ml.

8. A polypropylene resin characterized by the following relationship:

$$10 \quad FM / ((XS - 0.74\%E) * MWD) \geq 30,000 \text{ p.s.i.};$$

$$XS \leq 2 \text{ wt\% } + \%E; \text{ and}$$

$$MWD \leq 6;$$

wherein: FM is the 1% secant flexural modulus;

%E is the weight percent of units derived from ethylene in the polypropylene;

XS is the weight percent of the xylene soluble content of the resin; and

MWD is defined as M_w/M_n .

9. The polypropylene of Claim 8, wherein the polypropylene comprises a homopolymer having a MWD of less than 5.5.

10. The polypropylene of Claim 9, which exhibits a haze value of less than 30%.

11. The polypropylene of Claim 9 having a pentad isotacticity of at least 98%, a pentad to triad ratio of at least 98%, a crystallinity of at least 73%, and a crystallization temperature greater than 130°C.

12. The polypropylene of Claim 8, wherein the polypropylene comprises a copolymer having a %E of 2% or less.

13. The polypropylene of Claim 12 having a pentad isotacticity of at least 93% and a crystallinity of at least 55%.

5 14. The polypropylene of Claim 13, wherein the polypropylene exhibits a melting point temperature less than the melting point temperature of a conventional Ziegler-Natta catalyzed polypropylene having equivalent crystallinity.

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15. The polypropylene of Claim 12 having a pentad isotacticity of at least 94% and a crystallinity of at least 60%.

15 16. A polyolefin composition, comprising:

(a) a polypropylene resin characterized by the following relationship:

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$$FM / ((XS - 0.74\%E) * MWD) \geq 30,000 \text{ p.s.i.};$$

$$XS \leq 2 \text{ wt\% } + \%E; \text{ and}$$

$$MWD \leq 6;$$

wherein: FM is the 1% secant flexural modulus;

25 $\%E$ is the weight percent of units derived from ethylene in the polypropylene;

XS is the weight percent of the xylene soluble content of the resin; and

MWD is defined as M_w/M_n ; and

(b) less than 40% by weight of an impact modifier.

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17. The polyolefin composition of Claim 16, wherein the polypropylene resin comprises a homopolymer polypropylene and wherein the composition exhibits 1% secant flexural modulus of at least 220,000 p.s.i., a
35 ductile to brittle transition temperature of less than 0°C,

and haze value of less than 25%.

18. The polyolefin composition of Claim 17, wherein
the composition exhibits a 1% secant flexural modulus of
5 at least 240,000 p.s.i.

19. The polyolefin composition of Claim 16, wherein
the polypropylene resin comprises a propylene-based
copolymer having less than 3 % by weight of units derived
10 from ethylene and wherein the composition exhibits 1%
secant flexural modulus of at least 170,000 p.s.i. and
haze values of less than 25%.

20. The polyolefin composition of Claim 19, wherein
15 the polypropylene resin has less than 1% by weight units
derived from ethylene and wherein the composition exhibits
1% secant flexural modulus of at least 180,00 p.s.i.